

WHAT IS CLAIMED IS:

1. A code reader to read a code from a data recording medium which records data as an optically readable code and is provided with a non-interference area around said code to prevent presence of only an interference image having an attribute causing an error during reading of said code, said code reader comprising:

an image pickup section to pick up said code;

a guide section configured to specify positional relationship between said image pickup section and said code;

a code detection section to set a code detection area in an image pickup screen obtained in said image pickup section and detect at least part of said code from the inside thereof; and

a restoration section to specify said code from said image pickup screen based on a detection position of at least part of said code detected in said code detection section and restore data recorded in said code, wherein

said code detection area is determined based on an alignment error between said image pickup section and said code due to said guide section and a specification of said code.

2. The apparatus according to claim 1, wherein said guide section allows part thereof as a guide

positioning section to touch a recording medium  
positioning section as part of said recording medium  
and determines a positional relationship between said  
image pickup section and the code.

5           3. The apparatus according to claim 2, wherein  
            said guide section is a slit, and  
            said data recording medium is shaped into a card,  
            and inserting said card-shaped data recording medium  
            into said slit determines positional relationship  
10           between said image pickup section and the code.

            4. The apparatus according to claim 2, wherein  
            said alignment error is determined by a contact  
            error between a guide section and a recording medium in  
            said guide positioning section.

15           5. The apparatus according to claim 2, wherein  
            said alignment error is determined by an assembly  
            error of said image pickup section against said guide  
            positioning section.

            6. The apparatus according to claim 2, wherein  
20           said alignment error is determined by a recording  
            position error of said code against said recording  
            medium positioning section.

            7. The apparatus according to claim 1, wherein  
            said non-interference area is widened on one of  
25           upper side and lower side of said code, and  
            said code detection section starts detection from  
            the wider side of said non-interference area and

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terminates detection when detecting part of the code.

8. The apparatus according to claim 1, wherein said code comprises a plurality of blocks, each of said blocks comprises an arrangement of a data area containing data divided from said data, a marker area containing a marker for identifying that block, and a block ID area containing block ID information for independently identifying that block, according to a specified positional relationship,

at least part of said code detected in said code  
detection section is said marker, and

9. The apparatus according to claim 8, wherein  
said code is read by means of relative scanning  
with reference to said image pickup section,

said non-interference area is narrowed in a portion other than an edge used to start scanning said code, and

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10. A code reader to read said code from a data recording medium which records data as an optically readable code, comprising:

an image pickup section to pick up a code;

an image detection section to detect a specified image from an image pickup screen obtained in said image pickup section, said specified image being

5 provided near said code on a data recording medium and being positioned according to a specified positional relationship with said code; and

10 a restoration section to specify said code from said image pickup screen based on a detection position of said specified image detected in said image detection section and to restore data recorded in said code.

11. The apparatus according to claim 10, wherein said specified image is part of an adjacent code.

15 12. A data recording medium comprising:

a portion where data is recorded as an optically readable code; and

20 a non-interference area which is provided around said code and prevents presence of only an interference image having an attribute causing an error during reading of said code, wherein

25 said recording medium stores said code read by a code reader having an image pickup section to pick up a code, a code detection section to set a code detection area in an image pickup screen obtained in said image pickup section and detect part of said code from the inside thereof, a restoration section to

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specify said code from said image pickup screen based on a detection position of part of said code detected in said code detection section and restore data recorded in said code, and a guide section configured to specify positional relationship between said image pickup section and said code, and

said non-interference area is determined based on said code detection area, an alignment error between said image pickup section and said code due to said guide section, and a specification of said code.

13. The medium according to claim 12, wherein

said data recording medium allows part thereof as a recording medium positioning section to touch a guide positioning section as part of said guide section and determines positional relationship between said image pickup section and the code.

14. The medium according to claim 13, wherein

said guide section is a slit, and

said data recording medium is shaped into a card,  
and inserting said card-shaped data recording medium  
into said slit determines positional relationship  
between said image pickup section and the code.

15. The medium according to claim 13, wherein

said alignment error is determined by a contact error between a recording medium and a guide section in said recording medium positioning section.

16. The medium according to claim 13, wherein

said alignment error is determined by an assembly error of said image pickup section against said guide positioning section.

17. The medium according to claim 13, wherein

5       said alignment error is determined by a recording position error of said code against said recording medium positioning section.

18. The medium according to claim 12, wherein

10       a data recording medium is read by a code reader in which said code detection section starts detection processing from a specified position in said code detection area and terminates detection processing when detecting part of the code, and

15       said non-interference area is widened on one of upper side and lower side of said code for said code detection section to start detection.

19. The medium according to claim 12, wherein

20       said code comprises a plurality of blocks, and each of said blocks comprises an arrangement of a data area containing data divided from said data, a marker area containing a marker for identifying that block, and a block ID area containing block ID information for independently identifying that block, according to a specified positional relationship.

25       20. The medium according to claim 19, wherein

      said data recording medium is read by a code reader which reads said code by means of relative

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scanning with reference to said image pickup section  
and provides said code detection section with  
a narrower code detection area used to detect  
the latter part of the code than a code detection area  
5 used to detect the beginning of the code during said  
scanning, and

said non-interference area is narrowed in a  
portion other than an edge used to start scanning said  
code.

10 21. A data recording medium comprising:

a portion where data is recorded as an optically  
readable code; and

the other portion, wherein

said recording medium stores said code read by  
15 a code reader having an image pickup section to pick up  
a code, an image detection section to detect  
a specified image from an image pickup screen obtained  
in said image pickup section, and a restoration section  
to specify said code from said image pickup screen  
20 based on a detection position of said specified image  
detected in said image detection section and to restore  
data recorded in said code, and

said specified image is provided near said code on  
a data recording medium and is positioned according to  
25 a specified positional relationship with said code.

22. The medium according to claim 21, wherein  
said specified image is part of an adjacent code.

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23. A card-shaped data recording medium  
comprising:

a portion which records visually readable images  
such as a character, symbol, figure, pattern, photo,  
5 etc.; and

a portion which records data as an optically  
readable code along a given cut side, wherein

a non-interference area is provided around said  
code to inhibit presence of only an interference image,  
10 out of said visually readable images, having an  
attribute causing an error during reading of said code,  
and

said non-interference area contains a longer width  
between said code and said cut side than a width  
15 between said code and said visually readable image  
arranged adjacently to said code.

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